

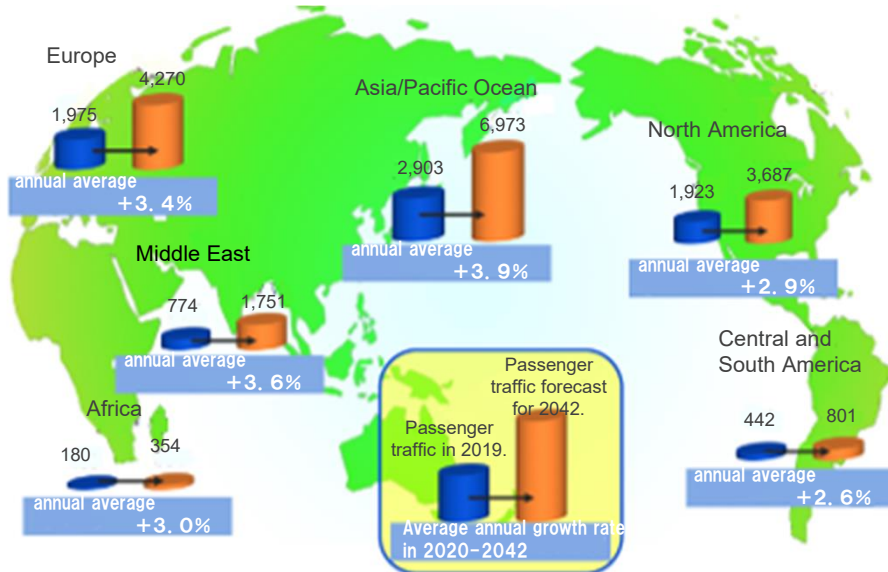
65 CARATS (Collaborative Actions for Renovation of Air Traffic Systems) (1)

○ History of CARATS

In 2003, ICAO developed the Global ATM Concept of Operations to promote the transformation of the air traffic system with a view to 2025 and beyond.
In 2009, “Study Group on Future Air Traffic Systems” was established, consisting of representatives from industry, academia and government, with the aim of responding to common global issues such as increasing air traffic, improving punctuality and flight efficiency, and countering global warming.
In 2010, the Long-term Vision for the Future Air Traffic System “Collaborative Actions for Renovation of Air Traffic Systems (CARATS),” was formulated and published. It aimed at advancing air traffic systems by 2025.

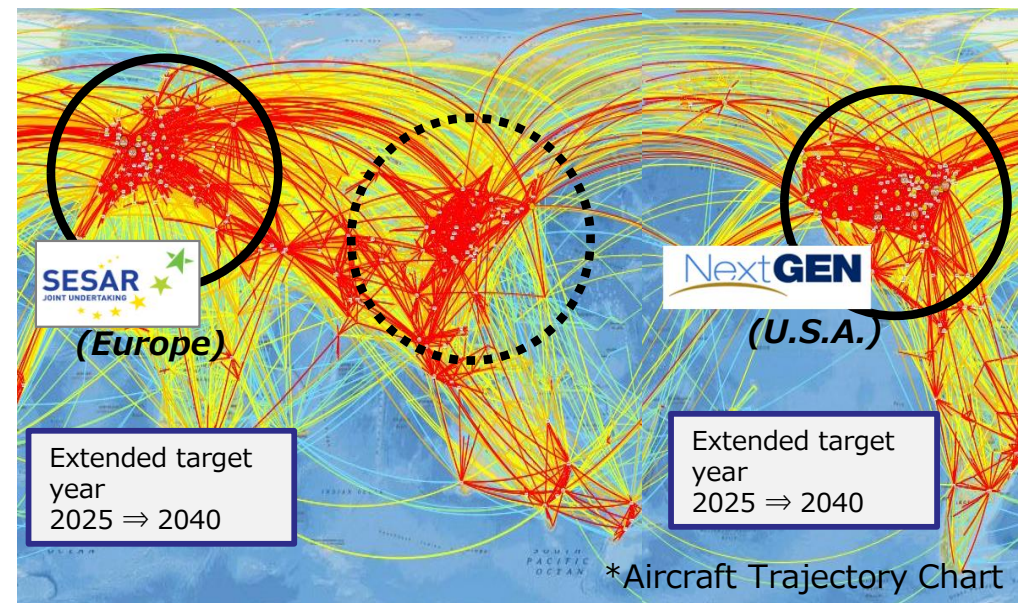
- In 2011, the CARATS Roadmap was formulated to systematically build a future air traffic system.
- In 2019, the target year of the CARATS roadmap was expanded from 2025 to 2040 in order to align with the future plans of the International Civil Aviation Organization (ICAO).

○ International Trends in International Air Transport



Source: Compiled by the Ministry of Land, Infrastructure, Transport and Tourism from data provided by the Japan Aircraft Development Association.

○ International Trends in Future Systems



- Air traffic control capacity expansion is indispensable to cope with increased demand, etc.
- Future volume of air passengers will increase mainly in the Asia-Pacific region.
- At the 37th ICAO General Assembly (October 2010), a resolution was adopted to address global warming in the international aviation sector.
 - 2% reduction in fuel efficiency annually
 - No increase in total CO₂ emissions after 2020

Long-term vision for future systems in Europe and the U.S.
(NextGEN, SESAR) in accordance with ICAO's vision.
Specific changes are being promoted.

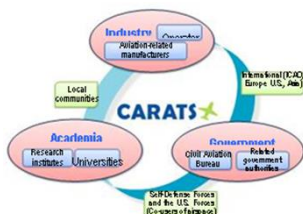
65 CARATS (Collaborative Actions for Renovation of Air Traffic Systems) (2)

○ Overview of CARATS

Direction of Change in CARATS	Summary
(1) Realizing trajectory-based operations (TBO)	Adjusting trajectories strategically and cooperatively prior to departure to achieve the flexible and optimal flight trajectory.
(2) Improving Predictability	Improving Predictability through calculation of ATC traffic control capacity, traffic flow forecasting, and sophistication of weather information.
(3) Promoting Performance-based Operation	ATC operation based on aircraft performance using high-precision RNAV (Area Navigation), satellite based navigation, etc.
(4) Realizing Satellite Based Navigation for All Flight Phases	Introduction of safe and highly flexible routing (4-Dimensional Trajectory, curved precision approaches) by satellite based navigation.
(5) Enhancing Situation Awareness on the Ground and in the Air	Improved situation awareness both on the ground and aircraft through the use of data communication and the introduction of air-to-air surveillance.
(6) Making Full Use of the Capability of Human Beings and Machines	Creating an environment that makes full use of the capacity of human beings and machines by allowing, for example, a pilot and a controller to focus on providing value-added service, by automating routine communication.
(7) Full information-sharing and Collaborative Decision-making	Introduction of a comprehensive network (SWIM: System Wide Information Management), etc.
(8) Realizing High-density Operation in Congested Airports and Airspace	Realization of high-density operation by utilizing support systems and accurate time management, etc.

○ Promotion Structure of CARATS

- The “Committee for Promoting Renovation of the Air Traffic System” was set up to steadily promote CARATS with the cooperation of industry, academia and the government.
- The Committee is continuously conducting PDCA for CARATS goals and roadmaps, and is studying and promoting everything from research and development to the introduction of measures.
- We are also considering reviewing the main text of CARATS (based on changing the target year from 2025 to 2040).



CARATS main text

Measure name	submeasureID	Sub-measure	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Free routing at high altitude	TBO-1-1	Phase1 (direct conversion of publicly announced routes)																															
	TBO-1-2	Phase2 (UPRintroduction)																															
	TBO-1-3	Phase3 (UPR+DARP)																															

CARATS Roadmap (excerpt)

CARATS HP

<https://www.mlit.go.jp/koku/carats/>



Official CARATS Youtube Channel

<https://www.youtube.com/channel/UCrva5VkicinKs8flyrtxSuQ>

